

IN THE CLAIMS:

Sub C3 1. A method for managing resource usage of a particular resource by a set of related code, the method comprising:

associating a resource indicator with the related code that indicates an amount
5 of resource usage of the particular resource by the related code; and
updating the resource indicator when the related code increases or decreases
its collective resource usage of the particular resource.

Sub A1 2. A method as recited in claim 1 wherein the resource indicator's amount
10 represents an absolute value of the resource usage.

3. A method as recited in claim 1 wherein the resource indicator's amount
represents a proportional value of the resource usage.

15 4. A method as recited in claim 1 further comprising:
associating the related code with each resource portion of the particular
resource that is allocated for the related code; and
disassociating the related code with each resource portion of the particular
resource that is deallocated for the related code,

20 wherein the resource indicator is decreased when a resource portion is
deallocated and increased when a resource portion is allocated for the related code.

25 5. A method as recited in claim 4 further comprising:
allocating the particular resource to the related code when the resource
indicator is below a maximum predetermined threshold; and

indicating an error and not allocating the particular resource when the resource indicator is above the maximum predetermined threshold.

6. A method as recited in claim 5 wherein the error is indicated by throwing an
5 out_of_memory exception.

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7. A method as recited in claim 4 wherein the related code is disassociated through a garbage collection procedure.

10 8. A method as recited in claim 1 wherein the particular resource is selected from a group consisting of memory usage, open file usage, open socket usage, and monitor usage.

15 9. A method as recited in claim 8 wherein the resource indicator indicates a percentage of the particular resource that is utilized by the related code.

10. A method as recited in claim 8 further comprising:
associating a plurality of thresholds with the particular resource and the related code; and

20 notifying a registered resource callback when the amount of resource usage of the particular resource by the related code exceeds a first one of the thresholds.

11. A method as recited in claim 8 further comprising notifying a registered resource callback when the amount of resource usage of the particular resource by the

related code drops below a second one of the thresholds that has a different value than the first threshold.

12. A method as recited in claim 8 further comprising notifying a registered
5 resource callback when the amount of resource usage of the particular resource by the related code drops below the first threshold.

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13. A method as recited in claim 1 wherein the particular resource is CPU usage or network usage.

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14. A method as recited in claim 13 further comprising:
associating a threshold with the particular resource and the related code; and
indicating that the related code's priority for CPU usage be decreased when
the amount of resource usage of the particular resource by the related code exceeds
15 the threshold.

15. A method as recited in claim 14 further comprising:
associating a second threshold with the particular resource and the related code; and
20 indicating that the related code's priority for CPU usage be boosted when the amount of resource usage of the particular resource by the related code drops below the second threshold.

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16. A method as recited in claim 1 wherein the related code is configured to be executed on behalf of an applet in the form of threads.

17. A method as recited in claim 1 further comprising:
associating a plurality of resource indicators with the related code that each
indicates an amount of resource usage of a plurality of resources by the related code;
5 and
updating a selected resource indicator when the related code increases or
decreases its collective resource usage of the associated resource.

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18. A method as recited in claim 17 wherein the resources include memory usage,
10 CPU usage, and network usage.

19. A method as recited in claim 18 wherein the resources further include open
file usage and open socket usage.

- 15 20. A computer readable medium containing computer codes for managing
resource usage, the computer readable medium comprising:
computer code for associating a resource indicator with the related code that
indicates an amount of resource usage of the particular resource by the related code;
and
20 computer code for updating the resource indicator when the related code
increases or decreases its collective resource usage of the particular resource.

21. A computer readable medium as recited in claim 20 further comprising:
computer code for associating the related code with each resource portion of
25 the particular resource that is allocated for the related code; and

computer code for disassociating the related code with each resource portion of the particular resource that is deallocated for the related code,

wherein the resource indicator is decreased when a resource portion is deallocated and increased when a resource portion is allocated for the related code.

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22. A method as recited in claim 21 further comprising:

computer code for allocating the particular resource to the related code when the resource indicator is below a maximum predetermined threshold; and

computer code for indicating an error and not allocating the particular resource when the resource indicator is above the maximum predetermined threshold.

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23. A computer readable medium as recited in claim 20 wherein the particular resource is selected from a group consisting of memory, open files, open sockets, and monitors.

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24. A computer readable medium as recited in claim 23 further comprising:

computer code for associating a plurality of thresholds with the particular resource and the related code; and

computer code for notifying a registered resource callback when the amount of 20 resource usage of the particular resource by the related code exceeds a first one of the thresholds.

25. A computer readable medium as recited in claim 23 further comprising computer code for notifying a registered resource callback when the amount of

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resource usage of the particular resource by the related code drops below a second one of the thresholds that has a different value than the first threshold.

26. A computer readable medium as recited in claim 20 wherein the particular
5 resource is CPU usage or network usage.

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27. A computer readable medium as recited in claim 26 further comprising:
computer code for associating a threshold with the particular resource and the
related code; and

10 computer code for indicating that the related code's priority for CPU usage be
decreased when the amount of resource usage of the particular resource by the related
code exceeds the threshold.

28. A computer readable medium as recited in claim 27 further comprising:
15 computer code for associating a second threshold with the particular resource
and the related code; and
computer code for indicating that the related code's priority for CPU usage be
boosted when the amount of resource usage of the particular resource by the related
code drops below the second threshold.

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29. A method as recited in claim 20 wherein the related code is configured to be
executed on behalf of an applet in the form of threads.

30. A computer system for managing resource usage by a set of related code, the
25 computer system comprising:

a resource context associated with the set of related code, the resource context having a resource indicator that is associated with a resource type and indicative of how much of the resource type is being utilized by the set of related code;

5 a resource object associated with the resource context, wherein the resource object indicates how much of the resource type may be utilized by the set of related code; and

an update mechanism configured to increment the resource indicators of the resource context when the set of related code increases its resource usage of the resource type associated with the updated resource indicator.

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31. A computer system as recited in claim 30 wherein the resource object has an associated maximum limit that indicates a maximum amount of resource usage by the set of related code for the resource type.

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32. A computer system as recited in claim 31 wherein the resource object has an associated first limit that is lower than the maximum limit, the computer system further comprising an alarm configured to alert the set of related code when its resource usage exceeds the first limit.

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33. A computer system as recited in claim 32 wherein the alarm is further configured to alter the set of related code when its resource usage drops back below the first limit.

25 34. A computer system as recited in claim 32 wherein the resource object has an associated second limit that is lower than the first limit and the alarm is further

configured to alter the set of related code after its resource usage rises above the first limit and then drops back below the second limit.

35. A computer system as recited in claim 30 wherein the resource type is selected from a group consisting of memory usage, CPU usage, network usage, open file usage, open socket usage, and monitor usage.

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36. A computer system as recited in claim 30 wherein the update mechanism is further configured to map the resource context to any resource portions of the
10 resource type that are allocated on the resource context's related code's behalf.

37. A computer system as recited in claim 30 wherein the set of related code of the resource context is associated with a single protection domain.

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